the Center for a Competitive Waste Industry

A New Found Lands Company

May 30, 2012

Dr. Holly Stallworth, Ph.D., Designated Federal Officer
Clean Air Scientific Advisory Committee (CASAC)
Science Advisory Board
U.S. Environmental Protection Agency
1300 Pennsylvania Ave., NW – Mail Code 1400R
Washington D.C. 20004

RE: Request for SAB to Expand Its Review of EPA's Draft Accounting Framework for Biogenic CO2 Emissions from Stationary Sources in Order to Include Compliance with §112 of the Clean Air Act Amendments of 1990

Dear Dr. Stallworth:

By letter dated May 18, 2012, the Solid Waste Association of North America (SWANA) has asked that carbon dioxide (CO_2) emissions from landfills be considered biogenic under the Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources, dated March 9, 2012. The basis for SWANA's request is that these are "anyway" emissions that do not implicate the Manomet concerns about changes in land use, and, therefore, ought not count.

With respect, we at the Center for a Competitive Waste Industry (CCWI) consider that the volume of landfill gases generated in a year is not, in any way, inevitable. Rather they vary with the fraction and types of discards that are diverted away from landfills. As such, CO_2 emissions from landfills are not biogenic and should be counted.

Furthermore, looking ahead to where all these preliminary issues are headed under the Tailoring Rule, the ultimate question is, when permits are required, what are the best practices and technologies to minimize greenhouse gas (GHG) emissions. There is an issue over the adequacy and scientific basis of a key regulation under the Clean Air Act, with enormous implications for the effectiveness of the GHG reduction effort. An investigation of this issue should be opened now so that the results will be ready when the time comes to issue those GHG permits.

CCWI is a non-profit research organization, headquartered in Madison, Wisconsin, dedicated to encouraging a level field on which all of the varied strategies for managing discards can compete fairly, and in which none enjoys the kinds of major subsidies that currently favor landfilling, which is universally considered to be the lowest preferred discard management option.

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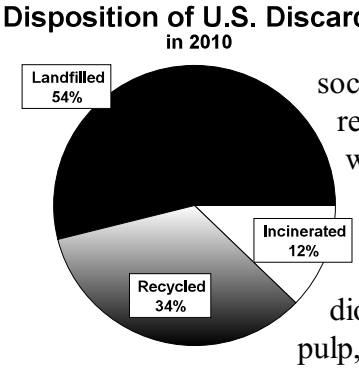
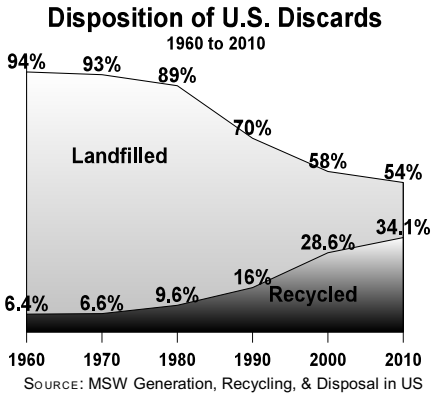
Landfill CO_2 Emissions are not Inevitable



To support its "anyway" claim, SWANA calls the material discarded from homes, stores, offices and institutions "waste" that, inevitably, is destined for landfills. But, properly considered, "waste" is post-use material that no longer has any societal value. In fact, 34% of the material SWANA calls "wastes" is currently recycled, and that includes 63% of the paper and 58% of the yard trimmings, which are among the major sources of landfill gases, according to EPA's report, *Municipal Solid Waste Generation, Recycling, and Disposal in the U.S.* (2011).

There are two reasons that recycling reduces the volume of carbon dioxide released into the atmosphere. First, when recycled is substituted for virgin pulp, as one example, the demand for land under cultivation for tree farms declines.

Second, there is a significant quantity of upstream energy inputs involved in the production of products and packaging, which no longer remains embedded in the discarded item. EPA, *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices* (2009). Using recycled instead of virgin feedstock reduces energy demands, and the associated fossil CO_2 emissions, that was consumed in their production.



SOURCE: MSW Generation, Recycling, & Disposal in US

Moreover, the fraction of discards diverted is increasing over time, as the proportion of total generation destined for landfills has fallen from 94% in 1960 to 54% today, a decline of 43%. Similar, the fraction recovered has increased from 6.4% in 1960 to 34.1% in 2010, according to that same report. In addition, uncounted in the underlying Franklin methodology, but nonetheless a real consideration, is the significant source reduction seen in the marketplace during that time period, such as the shift from printed to electronic media, grass-cycling and light-weighting, which eliminates the need for any end-of-life materials management.

The shifting relationship of landfilling versus recycling demonstrates that what is "wastes," relative to economically recoverable material varies with market conditions and over time. During that period, the first federal regulations were enacted for MSW landfills in 1984, 42 U.S.C. 6921 *et seq*, and rules for groundwater releases were promulgated in 1991, 40 CFR Part 258, and for air emissions in statute in 1990, 42 USC §7401 *et seq*, and rules in 1996, 40 CFR Part 60 Subpart WWW. To the extent these regulations significantly failed to minimize externalities, the cost of landfilling relative to recycling would incorrectly seem lower, and recycling's rise would be retarded, which raises the next question for CASAC. If EPA were to show itself to be unwilling to impose statutorily mandated rules only because they might significantly increase costs to the regulated industry, that would be a prescription for subsidization and a distortion of the free market with negative impacts on greenhouse gas emissions.

SAB SHOULD RECOMMEND THAT EPA COMPLY WITH §112

At the end of the tailoring rule process, EPA states that it intends to adopt final rules to reduce greenhouse gas emissions from the large sources that are covered by the thresholds, including NSPS landfills. Although the general benchmark for the GHG requirement is the BACT standard, EPA has said that each permit will, at a minimum, contain all currently applicable requirements under the Clean Air Act, 40 CFR §70.12, which for landfills include their undisputed hazardous air emissions, 56 FED. REG. 104 (May 30, 1991), at 24474.

The matter that we put to the Board, and to which we request a formal written reply, is whether EPA has improperly refused to comply with relevant statutory requirements, in particular those that pertain to landfills as a source of hazardous air pollutants (HAP). For, if this is the case, then landfill costs will improperly appear lower, recycling's growth will be retarded, and not just carbon dioxide emissions will increase due to market distortions, but far worse, methane, with its global warming potential (GWP) between 33× (100 year basis) and 105× (20 year basis) CO_2's. Drew Shindell (NASA), "Improved Attribution of Climate Forcing to Emissions," 326 *Science* 5953, at pp. 716-718 (2009). For methane emissions follow in tandem with emissions of CO_2.

§112 of the Clean Air Act Amendments of 1990 (CAAA) requires significantly stricter MACT standards for listed sources of HAPs, 42 U.S.C. §7412(c)(2), which for landfills would translate into very substantially lower GHG emissions as methane, with its very high GWP, would be shunted to and >90% destructed in shrouded flares.

Beginning in 1991, EPA has repeatedly acknowledged that §112 applies to landfills because 12 of the listed HAPs are emitted by landfills, including the suspected carcinogens benzene, carbon tetrachloride, chloroform, ethylene bichloride, methylene dichloride, perchloroethylene, trichloroethylene, vinyl chloride and vinylidene chloride. Yet, it refused to implement §112 for landfills because, initially, the agency said, it "could not determine [from the existing literature] reasonable estimates of annual incidence ... of the cancer risks." 56 FEDERAL REGISTER 104, at 24468, 24470, 24472 and 24474 (May 30, 1991); 61 Federal Register 49, at 9917 (March 12, 1996).

Of note, the reason that EPA could not find statistical significance of adverse health outcomes from living near landfills was not because the problem is intrinsically intractable, but rather because no one has yet committed the resources to conduct a proper study. Without such resources, the several studies that had been done (State of New York Department of Health, *Investigation of Cancer Incidence and Residence Near 38 Landfills With Soil Gas Migration Conditions, New York State, 1980-1989* (1998); Paul Elliot, "Risk of adverse birth outcomes in populations living near landfill sites," 323 *British Medical Journal* 363 (Aug. 2001)) defined the exposed population as an expedient based upon such things as postal zip codes, which have only a vague overlap with the downwind neighbors. When possibly half or more of the studied population was not, in fact, exposed, when no attempt is made to determine individual exposure to epidemiological bio-markers, reliable statistical inferences will inevitably remain elusive.

At best, this excuse could only have been justified in 1991 when it was first raised. But, that was more than 20 years ago, and, especially in light of the agency's repeated statements of concern about environmental justice, it strains credulity to maintain that the resources could not have been found for a valid study design in all of that time so that the area sources, such as landfills, could have been fitted for MACT rules.

One among many places from which funds could have been shifted without impacting the agency's other bona fide objectives is EPA's 33 corporate partnership programs. This voluntary program achieved such notable accomplishments as awarding an EnergyStar certificate to a mock gasoline-powered alarm clock submitted by government auditors who found "this pattern is rampant throughout the partnerships," Government Accountability Office, *Energy Star Program: Covert Testing Shows the Energy Star Program Certification Process Is Vulnerable to Fraud and Abuse* (2010). For all the millions spent, and staffing diverted from permitting, no statistical evidence could be found that corporate behavior had been substantially altered, other than providing greenwashing benefits, Thomas Lyon, "Environmental Public Voluntary Programs Reconsidered," 35 *The Policy Studies Journal* 4 (2007).

In the end, distinct from its unwillingness to fund the requisite studies, EPA's subsequent acts create the disturbing inference that its claim to have had its hands tied by a lack of evidence may not have ever been raised in good faith. For in 1999, with the 10-year deadline for action on categorizing the most important area sources looming, 42 U.S.C. §7412(c)(3), EPA was no longer able to deny that, in order to reach 90% of the toxic emissions in urban areas, with or without actual studies of their incidence of cancer, landfills would have to be included. 64 FED. REG. 137, at 38706 (July 19, 1999).

If the statutory mandates had then been adhered to, that would have required the imposition of stricter MACT standards under 42 U.S.C. §7412(d), were it not for the agency's continuing determination to prevent the imposition of any regulatory costs on the landfill industry, no matter how necessary to prevent the externalization of health costs onto the public.

For what EPA deemed were MACT standards for landfills had a fatal shortcoming. Other than for collateral startup/shut down marginalia, EPA stated that "the final [MACT] rule contains the same requirements as the [BACT standards]," 68 FED. REG. 11, at 2229 (January 16, 2003) – although it would be a challenge to call those earlier standards "rules" in the usual sense of the word.

Rather, NSPS landfills under BACT had been allowed "to design their own gas collection systems [in order] to provide flexibility and encourage technological innovation." Even that gentle admonition only applied to the largest landfills, while 95% of all landfills were exempted, as were the first five years of operation and most of the time after the site is closed, 61 FED. REG. 49, at p. 9907-9909 (March 12, 1996); 40 CFR §60.752 (b), which was when 90% of the gases were released, Intergovernmental Panel on Climate Change (IPCC), *Fourth Assessment Report: Waste Chapter*, at p. 600 (2007).

On examination, the 17,223 words in the landfill BACT rule, which EPA now deemed worthy of exaltation into MACT status, had added little in aggregate to what was already being done by the landfill industry. That was to provide a pressure relief valve while the site was sealed up in order to prevent the sheer volume of gas that accumulated in the largest landfills from blowing out the expensive caps (see photo). Inasmuch as most of a landfill's lifetime gases were generated before and afterwards, *Fourth Assessment*, the industry's financial motivation to avoid repeatedly replacing those covers provided little GHG benefits.

Blown out cover at large landfill without gas collection

Most telling of the validity of the rule-making, in order to declare BACT to be MACT, EPA simply ignored the specific procedural protections that Congress imposed in order to prevent administrative backsliding, including a survey of the top 12% performing sources as a proxy to objectively quantify what was maximally achievable, 42 USC §7412 (d)(3)(A). For otherwise that would have found a plethora of better practices, especially at many of the publicly managed sites, which are among SWANA's members.

To provide the Board with a concrete idea of what is involved, in 2010, the Sierra Club undertook a literature search and prepared a report that included a list of design and operational criteria for the best performing gas collection systems. Sierra Club, *Report on Landfill-Gas-to-Energy* (2010), at APPENDIX B, which is summarized in the SIDEBAR on the next page and can be found in full on-line at http://www.sierraclub.org/policy/conservation/landfill-gas-report.pdf.

The Clean Air Scientific Advisory Council has a broad mandate to provide independent advice and counsel to EPA on the adequacy and scientific basis of any proposed criteria document, standard, limitation, or regulation under the Clean Air Act Amendments of 1990. Here that includes the GHG tailoring rule, which, imminently, will bring up the question of the appropriate technical standards to apply. 42 U.S.C. § 4365.

This matter is especially timely now, in that, not only did EPA fail to originally comply with §112, not only did fail to promulgate valid hazardous standards when it did purport to act, but also it ignored its obligations to later review those rules. EPA was supposed to have "review[ed], and revise[d] as necessary (taking into account developments in practices, processes, and control technologies) [the putative MACT standard for landfills] no less often than every eight years," or 2011, 42 USC §7412(d)(6), but did not comply with that requirement either.

For these reasons, we ask the Board to review EPA's actions and failings of which we complain, and recommend that EPA comply with §112 by the adoption of substantive landfill standards such as those compiled by the Sierra Club as part of its 8-year review, and to, thereupon, use them in the GHG tailoring rule.

Before the Board's counsel floats an Armada of procedural arcana why this issue should not even be considered, we ask its members to balance the administrative tendency to avoid difficult decisions with the implications that would follow were EPA's decades long regulatory abdication allowed to stand.

For one thing, real people live, and likely suffer, near the more than 2,000 landfills operating in the U.S. We may not – you may not – nor any agency staff involved in drafting the rules – and certainly not the CEOs of the waste firms that build most of the landfills. But tens of thousands of hapless people do – involuntarily – most often without the resources to pick up and move.

May we recount one of their stories for you about someone young struck down by an extremely rare but highly malignant childhood cancer. Although its etiology is not known, other than an apparent environmental component, it occurred twice in the same neighborhood around the same time. What can be statistically inferred from the weak studies that have been done at landfills is low birth weights, which are known to be a sensitive marker of possible fetal chemical exposure. Martine Vrijheid, "Health Effects of Residence Near Hazardous Waste Landfill Sites: A Review of Epidemiological Literature, 108 *Env. Health Perspectives*. 1, at 101 (2000).

Even though you have been trained to dismiss anecdotal stories, something must be allowed to filter down to policymakers to impress the need for action when, over two decades, EPA refuses to allocate funding sufficient to tease out causality from small numbers; when ATSDR, the default agency left to do pro forma investigations, has been corrupted with "a mindset that endeavors to disprove any link between the public's ill-health effects and potential exposures to environmental contaminants or toxins," House Committee on Science and Technology, *ATSDR: Problems in the Past, Potential for the Future?* (2009), and when nothing – nothing – is done to protect the public notwithstanding §112 demands.

Best Practices for Landfill Gas Collection

(1) ***Early Horizontal collectors.*** Install horizontal gas collectors in active areas in each lifts prior to installation of vertical wells, but delay operation until there is sufficient depth and cover to apply a vacuum. Space horizontal collectors to overlap each pipes' zone of influence when negative pressures are applied without short circuiting without a low permeable cover. Do not co-utilize horizontal collectors for gas collection and liquid recirculation.

(2) ***Multiple wells in same bore holes.*** Install different vertical wells for different depths in same bore hole in order to be able to apply distinct optimal negative pressures at each level as compaction increases with depth but the risk of excess infiltration from the surface diminishes.

(3) ***Leachate collection system connection.*** Connect the leachate collection system (LCS) at the high side on bottom of landfill, which often carries gas that follows the LCS gravel trench or piping, to the active gas collection system (GCS).

(4) ***Multiple seals around bore holes.*** Utilize at least three sets of seals or their equivalent, including bentonite, clay and well bore seal, to connect the collection wells to the final composite cover in order to minimize air infiltration and maximize vacuum forces. Check methane leak rates around the seals at each well head monthly during typical atmospheric conditions using an analyzer compliant with EPA Method 21, and if greater than 500 parts per million above background, repair the seal within three days.

(5) ***Installation of vertical collectors, maximum slopes and final cover.*** Each cell should be designed to reach final grade in not more than one year from first waste emplacement. The active vertical collectors should be installed by that time and connected with headers to a vacuum system. Not more than one year after reaching final grade, a final low permeable cover less than 1×10^{-5} cm/sec. should be installed. If a geomembrane is used to provide a low permeable barrier, exterior side slopes should not exceed 4:1 to facilitate stabilization over a geomembrane. Alternate final covers are incompatible with effective active gas collection and should no longer be allowed.

(6) ***Delay any recirculation of leachate.*** Leachate circulation is not being recommended, but if it is, do not commence recirculation until after an expendable low-permeable cover and active gas collection system has been installed.

(7) ***De-water flooded vertical wells.*** In addition to monitoring each well's performance for oxygen and nitrogen infiltration, monitor gas volumes to detect wells that may be flooded, and pump out flooded wells.

References

Don Augenstein, et. al., *Improving Landfill Methane Recovery -- Recent Evaluations and Large Scale Tests* (2007); Hans Oonk, *Expert Review of First Order Draft of Waste Chapter to IPCC's Fourth Assessment Report* (2008). SCS Engineers, *Technologies and Management Options for Reducing Greenhouse Gas Emissions From Landfills* (2008); and 40 CFR Part 60 WWW.

For most of her life, Arsonia Leisure told us, she has lived on Warren Street near Waste Management's Pottstown Landfill in Pennsylvania, 40 miles northwest of Philadelphia. But, even though she could usually smell the garbage, she had never given it that much thought.

At least not until her last child, London, after months of puzzling symptoms, was diagnosed with a very rare type of abdominal cancer as he approached the age of 17. He had been about to graduate from high school, where he played for the school's championship basketball team, the Trojans, when he inexplicably began falling down on the court. Not till a year later did the doctors discover that the phlebitis they were treating him for actually was a fatal malignancy.

As long as he could, London tried to keep up a brave front. Even as he lost the ability to walk – and the once star athlete was reduced to crawling on the floor to get to the bathroom – he made plans for college with the scholarship he had earned and for a career in banking. But nine months after the diagnosis, the cancer that lurked inside his muscles had spread, and the next chapter that confronted him was his final round of chemotherapy in a last desperate attempt to beat the implacable odds.

With that, again came the catheters and the blood transfusions; and this time also the feeding tubes, infections and the agony as one organ after another failed. In the end, he was hooked up to the respirator, and his family was left to watch helplessly as his body wasted away. Finally, his mother, who loved him so ferociously, told the Children's Hospital in Philadelphia to give her boy enough morphine so he wouldn't feel any more pain. Still, five times London violently wrenched himself out of a coma back to life, which was when the doctor advised her to "tell him that it's okay to die." Stifling her tears, she tried, but he was too far gone to hear, and so she prayed for God to take from her the decision to end his suffering. As the curtain closed, the duty fell to his older sister to remove the respirator.

Arsonia was left with the ineffable anguish that a mother faces when she buries her own child. Ever since the memorial service, she has pondered his short life in her mind, asking herself again and again what she had done wrong. Had she sterilized his bottles enough when he was a baby? Had she taken him to the doctor to get him all his vaccinations? And what about his booster shots?

Then, she remembered those hot summer nights when he was still a child, those nights she would leave all the windows open to catch a breeze. Often draped over the humid air was the terrible stench wafting from the landfill. The odor was the worst in his bedroom because his room faced that place, and, in spite of the oppressive heat, she would have to shut his window. Slowly, almost imperceptibly, the possibility of a link between the garbage and her son's death began to germinate in her mind.

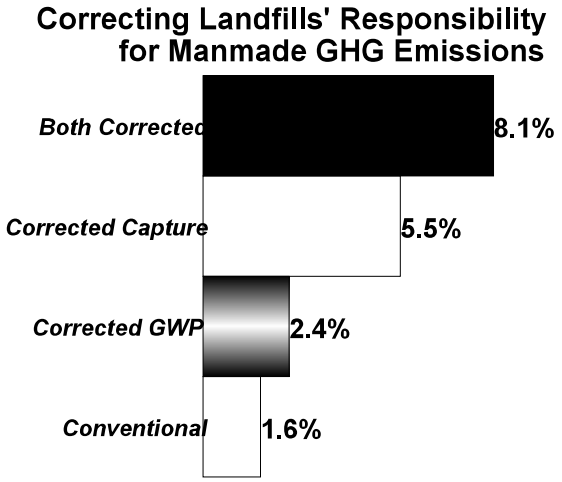
A few years later something else happened, something that cemented her darkest suspicions about the landfill. Even though the incidence of London's extremely rare childhood cancer, rhabdomyosarcoma, is only supposed to occur in 1 in 3 million among the general population, another boy in the vicinity died from it.

All told, according to a local group organized in the neighborhood, the incidence of cancer among the children around the Pottstown Landfill is almost 100% higher than the rest of the state. Elevated incidence of breast cancer, cervical cancer, lung cancer and brain cancer have also been found in the area, they note, on-line at http://www.acereport.org/expansion.html.

From a young age, we have all been trained to avert our eyes from such things, as if these good people were derelicts passed out in a drug induced stupor on the sidewalk. In this way, we need not see the real harms from the effluvia of our comfortable lives, and, thereby, confront the injuries our apathy inflicts on innocents.

Ethicists and moralists might say that it is fitting, then, that those who live behind literal, or figurative, high walls in gated communities are now properly suffering blow-back from years of indifference. For that same trash-generated "methane [that] acts as a stripping gas, moving the [landfills' hazardous compounds] to the atmosphere," 56 FED. REG. 104 (May 30, 1991), at 24473, now threatens to overheat the planet on which we all, rich and poor alike, depend, IPCC, *Summary for Policymakers* (2007).

For serious questions also abound with EPA's conclusion that landfills are only responsible for 1.6% of anthropogenic greenhouse gas emissions, EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010* (2012), which relies upon guesstimates of what the best run systems achieve during the limited time when the sites are sealed and little gas is generated, along with outdated calculations of methane's potency before indirect impacts were quantified. Correct for methane's true GWP, and landfills' responsibility increases to 2.4%. Correct for what average landfills actually capture over a landfills' entire life, according to the IPCC's *Fourth Assessment*, and that increases to landfills' contribution to 5.5%. Together, landfills are more likely responsible for 8.1% of manmade GHG emissions, and almost double that in the critical short term when we confront irreversible tipping points. Landfills are the largest source of GHGs after electricity, transportation and factories.



If EPA were but willing to regulate landfills as Congress required in §112 so that their neighbors can be protected, much more of that fugitive methane would also be captured, protecting us all from some of the worst threats of climate change. And as for those increased regulatory costs to landfills, sending the correct price signal will help the public to make informed decisions as between the several alternatives to the lowest ranked option in EPA's Hierarchy so that the free market can function as intended. The stakes are too high to continue sweeping landfills under the rug – this time for all of us.

The Center respectfully asks the Board to not only reject claims that landfill CO_2 is biogenic, but, more important, to recommend to EPA that the agency comply with §112, at long last.

Sincerely,

Peter Anderson

PETER ANDERSON, *Executive Director*
THE CENTER FOR A COMPETITIVE WASTE INDUSTRY

PA/ch
cc: Dr. John Skinner
Hon. Lisa Jackson